WHAT IS CLAIMED IS:

1. A liquid droplet ejection apparatus comprising:

a pressurizing chamber communicating with a liquid supply path via a liquid introduction bore;

an ejection nozzle connected to said pressurizing chamber, said ejection nozzle having a circular ejection opening; and

means for changing a volume of said pressurizing chamber so as to pressurize liquid introduced into said pressurizing chamber via said liquid introduction bore to thereby eject said liquid as liquid droplets from said ejection opening of said ejection nozzle, said means comprising a piezoelectric/electrostrictive element;

wherein a diameter of a largest liquid droplet among said ejected liquid droplets is not greater than a diameter of said ejection opening.

2. A liquid droplet ejection apparatus comprising:

a pressurizing chamber communicating with a liquid supply path via a liquid introduction bore;

an ejection nozzle connected to said pressurizing chamber, said ejection nozzle having an ejection opening; and

means for changing a volume of said pressurizing chamber so as to pressurize liquid introduced into said pressurizing chamber via said liquid introduction bore to thereby eject said liquid as liquid droplets from said

ejection opening of said ejection nozzle, said means comprising a piezoelectric/electrostrictive element;

wherein a plurality of liquid droplets are simultaneously ejected from said ejection opening by means of a single pressurization operation.

3. A liquid droplet ejection apparatus comprising:

a pressurizing chamber communicating with a liquid supply path via a liquid introduction bore;

an ejection nozzle connected to said pressurizing chamber, said ejection nozzle having an ejection opening; and

means for changing a volume of said pressurizing chamber so as to pressurize liquid introduced into said pressurizing chamber via said liquid introduction bore to thereby eject said liquid as liquid droplets from said ejection opening of said ejection nozzle, said means comprising a piezoelectric/electrostrictive element;

wherein a plurality of liquid droplets ejected from said ejection opening by means of a single pressurization operation simultaneously reach an imaginary plane defined such that all points on the plane maintain an equal distance from said ejection opening.

4. A liquid droplet ejection apparatus as described in Claim 1, wherein

each of said liquid introduction bore and an ejection-side end portion of said ejection nozzle have a hollow, substantially cylindrical form, and a bottom face of said cylinder forming said ejection-side end portion of said ejection nozzle defines said ejection opening;

wherein a ratio of a diameter of said liquid introduction bore to a diameter of said ejection opening is in a range of 0.6 to 1.6;

wherein a ratio of said diameter of said ejection opening to a height of said hollow cylinder forming said ejection-side end portion is in a range of 0.2 to 4; and

wherein a rate of change per unit time in a ratio of an amount of change in a volume of said pressurizing chamber to a sum of a volume of said ejection nozzle and said volume of said pressurizing chamber is in a range of 6 ppm/μs to 40 ppm/μs.

5. A liquid droplet ejection apparatus comprising:

a pressurizing chamber communicating with a liquid supply path via a liquid introduction bore;

an ejection nozzle connected to said pressurizing chamber, said ejection nozzle having a circular ejection opening; and

means for changing a volume of said pressurizing chamber so as to pressurize liquid introduced into said pressurizing chamber via said liquid introduction bore to thereby eject said liquid as liquid droplets from said

ejection opening of said ejection nozzle, said means comprising a piezoelectric/electrostrictive element;

wherein a diameter of a largest liquid droplet among said ejected liquid droplets is not greater than a diameter of said ejection opening;

wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening; and

wherein an inside diameter of said cylinder increases toward said ejection opening.

6. The liquid droplet ejection apparatus as described in Claim 5, wherein a value obtained by dividing, by a height of said cylinder, a difference between a diameter of said bottom face of said cylinder and a diameter of a top face of said cylinder is in a range of 0.05 to 0.7; and

wherein said top face of said cylinder defines an opening located on a side of said pressurizing chamber.

7. A liquid droplet ejection apparatus as described in Claim 1, wherein an ejection-side end portion of said ejection nozzle comprises:

a first ejection bore formed in a thin-plate member and having a hollow, substantially cylindrical form having a top face located on a side of said pressurizing chamber and a bottom face located on a side of said ejection opening; and

a second ejection bore assuming a hollow, substantially cylindrical form and formed in a liquid-repellent layer formed on a surface of said thin-plate member located on a side of said ejection opening, a top face of said cylinder defining an opening connected to said bottom face of said first ejection bore, a bottom face of said cylinder defining said ejection opening of said ejection nozzle, in which an inside diameter of said second ejection bore increases toward said ejection opening.

8. A liquid droplet ejection apparatus as described in Claim 7, wherein a value obtained by dividing, by a height of said second ejection bore, a difference between a diameter of said ejection opening of said second ejection bore and a diameter of said opening of said second ejection bore connected to said first ejection bore is 0.5 to 2.0.

9. A liquid droplet ejection apparatus as described in Claim 1, wherein an ejection-side end portion of said ejection nozzle comprises:

a first ejection bore formed in a thin-plate member and having a hollow, substantially cylindrical form having a top face located on a side of said pressurizing chamber and a bottom face located on a side of said ejection opening; and

a second ejection bore having a hollow, substantially cylindrical form and formed in a liquid-repellent layer formed on a surface of said thin-plate member located on a

side of said ejection opening, a top face of said cylinder defining an opening connected to said bottom face of said first ejection bore, a bottom face of said cylinder defining said ejection opening of said ejection nozzle, in which an inside diameter of said first ejection bore decreases toward said second ejection bore, and an inside diameter of said second ejection bore increases toward said ejection opening.

10. A liquid droplet ejection apparatus as described in Claim 1, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening; and

wherein a protrusion portion is formed on an inside wall surface of said ejection-side end portion.

11. A liquid droplet ejection apparatus as described in Claim 1, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening;

wherein a protrusion portion is formed on an inside wall surface of said ejection-side end portion; and

wherein a ratio of a height of said protrusion portion to said diameter of said ejection opening is in a range of 0.03 to 0.17.

12. A liquid droplet ejection apparatus as described in Claim 1, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening; and

wherein three to twelve protrusion portions are formed along an inside wall surface of said ejection-side end portion.

13. A liquid droplet ejection apparatus as described in Claim 1, wherein said pressurizing chamber and said ejection nozzle are integrally formed of zirconia ceramics.

14. A method for ejecting liquid droplets by use of a liquid droplet ejection apparatus comprising a pressurizing chamber communicating with a liquid supply path via a liquid introduction bore having a hollow, substantially cylindrical form, an ejection nozzle connected to said pressurizing chamber, an end portion of said ejection nozzle, located on an ejection side opposite said pressurizing chamber, having a substantially hollow, cylindrical form, a bottom face of said hollow cylinder forming a circular ejection opening, and a piezoelectric/electrostrictive element for changing a volume of said pressurizing chamber, said liquid droplet ejection apparatus being configured such that a ratio of a diameter of said liquid introduction bore to a diameter of said ejection opening is 0.6 to 1.6 and such that a ratio of the diameter of said ejection opening to a height of said

hollow cylinder of said end portion located on the ejection side is 0.2 to 4, said method being adapted to eject liquid from said ejection opening and comprising a step of:

actuating said piezoelectric/electrostrictive element so as to attain a rate of change per unit time in a ratio of an amount of change in a volume of said pressurizing chamber to a sum of a volume of said ejection nozzle and the volume of said pressurizing chamber of 6 ppm/μs to 40 ppm/μs, to thereby pressurize said liquid introduced into said pressurizing chamber from said liquid supply path via said liquid introduction bore and simultaneously eject a plurality of droplets of said liquid through said ejection opening of said ejection nozzle.

15. A liquid droplet ejection apparatus as described in Claim 2, wherein each of said liquid introduction bore and an ejection-side end portion of said ejection nozzle have a hollow, substantially cylindrical form, and a bottom face of said cylinder forming said ejection-side end portion of said ejection nozzle defines said ejection opening;

wherein a ratio of a diameter of said liquid introduction bore to a diameter of said ejection opening is in a range of 0.6 to 1.6;

wherein a ratio of said diameter of said ejection opening to a height of said hollow cylinder forming said ejection-side end portion is in a range of 0.2 to 4; and

wherein a rate of change per unit time in a ratio of an amount of change in a volume of said pressurizing chamber to a sum of a volume of said ejection nozzle and the volume of said pressurizing chamber is in a range of 6 ppm/μs to 40 ppm/μs.

16. A liquid droplet ejection apparatus as described in Claim 2, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form such that a bottom face of said cylinder defines said ejection opening; and

wherein an inside diameter of said cylinder increases toward said ejection opening.

17. A liquid droplet ejection apparatus as described in claim 16, wherein a value obtained by dividing, by the height of said cylinder, a difference between a diameter of said bottom face of said cylinder and a diameter of a top face of said cylinder is in a range of 0.05 to 0.7; and

wherein said top face of said cylinder defines an opening located on a side of said pressurizing chamber.

18. A liquid droplet ejection apparatus as described in Claim 2, wherein an ejection-side end portion of said ejection nozzle comprises:

a first ejection bore formed in a thin-plate member and having a hollow, substantially cylindrical form having a top

face located on a side of said pressurizing chamber and a bottom face located on a side of said ejection opening; and

a second ejection bore having a hollow, substantially cylindrical form and formed in a liquid-repellent layer formed on a surface of said thin-plate member located on a side of said ejection opening, a top face of said cylinder of said second ejection bore defining an opening connected to said bottom face of said first ejection bore, a bottom face of said cylinder of said second ejection bore defining said ejection opening of said ejection nozzle, in which an inside diameter of said second ejection bore increases toward said ejection opening.

19. A liquid droplet ejection apparatus as described in Claim 18, wherein a value obtained by dividing, by a height of said second ejection bore, a difference between a diameter of said ejection opening of said second ejection bore and a diameter of said opening of said top face of said second ejection bore is in a range of 0.5 to 2.0.

20. A liquid droplet ejection apparatus as described in Claim 2, wherein an ejection-side end portion of said ejection nozzle comprises:

a first ejection bore formed in a thin-plate member and having a hollow, substantially cylindrical form having a top face located on a side of said pressurizing chamber and a bottom face located on a side of said ejection opening; and

a second ejection bore having a hollow, substantially cylindrical form and formed in a liquid-repellent layer formed on a surface of said thin-plate member located on a side of said ejection opening, a top face of said cylinder of said second ejection bore defining an opening connected to said bottom face of said first ejection bore, a bottom face of said cylinder of said second ejection bore defining said ejection opening of said ejection nozzle, in which an inside diameter of said first ejection bore decreases toward said second ejection bore, and an inside diameter of said second ejection bore increases toward said ejection opening.

21. A liquid droplet ejection apparatus as described in Claim 2, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening; and

wherein a protrusion portion is formed on an inside wall surface of said ejection-side end portion.

22. A liquid droplet ejection apparatus as described in Claim 2, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening;

wherein a protrusion portion is formed on an inside wall surface of said ejection-side end portion; and

wherein a ratio of a height of said protrusion portion to a diameter of said ejection opening is in a range of 0.03 to 0.17.

23. A liquid droplet ejection apparatus as described in Claim 2, wherein an ejection-side end portion of said ejection nozzle has a hollow, substantially cylindrical form and a bottom face of said cylinder defines said ejection opening; and

wherein three to twelve protrusion portions are formed along an inside wall surface of said ejection-side end portion.

24. A liquid droplet ejection apparatus as described in Claim 2, wherein said pressurizing chamber and said ejection nozzle are integrally formed of zirconia ceramics.